

**PROPOSED AGENDA**  
**CONSUMER ELECTRONICS MANUFACTURERS ASSOCIATION**  
**TELEVISION DATA SYSTEMS SUBCOMMITTEE (R-4.3)**  
**Las Vegas Hilton**  
**Conference Room 13-14**  
**Tuesday, January 7, 1997**  
**10:00 A.M. - 4:00 P.M.**

**PRESIDING CHAIRMAN:** Steve Sigman  
Zenith Electronics

1. Call to Order and Introductions
2. Approval of Minutes
3. Approval of Agenda
4. ATVCC Updates
  - 708 Update: Web Page; number confirmation; presentation to T3S/8
  - ATV test station: Letter to McKinney
  - Decoder simulation/testing
5. EIA-608(A)
  - Advisory/Recommended Practices
  - Ballot resolution
  - Content Advisory Issues: Recommendation to R4 as to how CEMA wants to handle with FCC; new version of 608 before Content Advisory completed; timetable for other pending items that modify/add to 608; Sony patent on clock setting; URL packet proposal from Mitsubishi
  - *Auto cable install*
6. Other
  - Subtitles
  - Emergency Messaging
  - CEMA directory of undefined packets
7. Mission Statement
8. New Business

## CONSUMER ELECTRONICS GROUP ELECTRONIC INDUSTRIES ASSOCIATION

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Minutes of the Meeting  
of the  
Television Data Systems Subcommittee (R-4.3)

Atlanta, GA

October 21, 1996

ACTION ITEMS FOR THE NEXT MEETING

Content Advisory Update  
Advisories  
CGMS  
Automatic Cable Installation  
ATVCC Update  
Mission Statement distribution  
DVD  
Emergency Messaging  
EIA Registry of packets with XDS  
EIA Web status for TDSS page

MEETING Meeting was called to order at 10:05 AM by Chair, Steve Sigman.

MINUTES Minutes of the August 19 were approved.

AGENDA Agenda was approved

CONTENT ADVISORY: The new chairman of the Content Advisory working group is Kelly Williams. Tom Zato will no longer be the chair. EIA has written a letter to NAB for funding assistance on this project. NAB has not yet responded. EEG has begun bench tests, and has conducted a demonstration of a blocking decoder. Testing will continue with place holders being used. HBO will be bench testing and field testing (cable and over-the-air). Specific proposals for coding of content advisory including HBO proposal will be tabled until the Valenti group provides a report of their recommendations. Receiver manufacturers must have something in place by Feb. 1998.

*sooner than*  
Thompson redistributed the recommended practice for program ratings. This working document needs to be updated as progress is made. One of the many questions that needs to be addressed included PIP and whether this needs to be blocked. It was recommended that the title for EIA608 pertaining to recommended practice be changed to standard.

Steve Sigman has copies of 6 patents that have similar concepts to content advisories. Steve will distribute these patents for discussion. Sony will investigate their clock-setting patent as it relates.

### ADVISORIES

Documents that have been distributed include Zenith, and Sanyo advisories. EIA will create a formal definition for advisories and create a framework for them. The committee discussed advisories and compared them to recommended practices, interim standards, and guidelines. Advisories are formal and are written in a structure to be determined by EIA. These advisories need to be approved by TDSS but can be launched by specific companies. Recommended practices are less formal than advisories and do not contain such a structure. Recommended practices do not need to be balloted and committees can change them when they wish. Guidelines are something like recommended practices.

Advisories will need to be issued by a specific company or companies. Companies cannot issue recommended practices. Advisories will need an introduction, background and models. The advisory will need to follow a specific structure and understood by the committee. The advisory will include the name of the firm submitting the advisory for approval; who to contact at the generating firm. Advisories will need to be approved by TDSS. Once the advisory is approved EIA will post the advisory to the EIA Web site. *and will be included with copies of the related standard.*

**Revision and Approvals:** A resolution task force was created to reconcile the two "no" votes cast against 608A. Task force was chaired by S. Sigman. Other members included Tom Schumann, Craig Cuttner, Warner Johnston, and Bill Posner. The working group has not yet resolved the differences. Steve Sigman and George Hanover will redistribute the ballots to the members and the working group will be reconvened. There were two ballots.

Ballot 3688 had: 16 ballots; 10 yes; 4 yes with comments; 2 no

Ballot 3688 1-A: 13 ballots; 10 yes; 2 yes with comments; 1 no

**CGMS-A:** Ballot is in. Fourteen ballots submitted. 11 yes and 3 no comment. No reconciliation necessary. Technical standards are being written by Bob Lambert at Disney and Bill Phil Connolly of Sony.

**AUTOMATIC CABLE INSTALLATION:** Cable channel mapping system document distributed. This proposal is similar to the previous one with a few changes. This document will be submitted to R4 once a recommended practice is developed. There is a technical problem that needs to be addressed with cable boxes that are upstream of the receiver. An automatic solution could not be determined. The manufacturer could shut off the mapping function or the user could turn off the feature. *A receiver can* *the presence* *can* Could not sense all sources of a cable box. Need to publish a guideline to address this. An action item for working group is to develop a recommended practice to turn the mapping on and off. This will be discussed at the next TDSS meeting.

### ADDITIONAL PACKET WITHIN XDS

Dave Broberg asked for an additional packet to be included into XDS. This packet would provide URL addresses. This concept has been filed for Patent protection by Mitsubishi. Action item for each TDSS member to think about the idea and be ready to discuss it at the next TDSS meeting.

### ATVCC UPDATE

**EIA-708, Minimum Requirements:** Revised draft of the specification EIA-708 is now available. Final draft probably will not be available until after testing is completed. Minimum requirements are contained within 708A.

**Simulation Development:** Contracts have been awarded to Ultech and AVIO. The project was reduced in scope due to limited fund availability. George Hanover said that EIA had monies available to satisfy this need. A memo would be put forth to EIA officially requesting funds for this purpose. About \$40,000 was needed for this purpose.

**Meeting at WRC in Washington:** Meeting took place September 5 at station WRC in Washington D.C. Attendees included Gerald Freda (NCI), George Hanover (EIA), Jim McKinney (head of model station), Paul Lyons (David Sarnoff Research Center), and Amnon Salomon (NCI). Jim conducted a tour of the facilities, Amnon gave a brief presentation of ATVCC activities. The advanced television station is currently broadcasting. There are no ATV persons watching these signal except for station staff. The goal is to broadcast programs to the shopping centers in the Washington D.C. area by the end of 1998. This is based on the fact that receivers would be available two years after the FCC adopts the currently proposed ATV standard under consideration.

Each shopping area in the Washington area will be assigned to a particular receiver manufacturer. The receiver manufacturer will be responsible for providing receivers to be viewed in that location (mall).

In addition to an ATV camera that is being used to broadcast ATV signals a tape of Lawrence of Arabia exists that is used for current demonstrations. Due to the cost of this ATV tape, the tape has been stored digitally to be more easily broadcast without concern for wearing out the expensive tape.

An RS232 connector exists going into the transport stream. This is on a piece of equipment manufactured by Lucent technologies. An RS323 connector also exists on the system exiting the transport. This RS232 connector exists on a Philips box.

That is the good news. The bad news is that the format going in and out is not what we would like or expect. In addition the time it takes to get into the transport and then out is about 850 milliseconds. Yes that is more than 3/4 of a second, not the 4/10 of a second we would like to

have seen or expected.

Concerning the format going in this is built to accommodate pure ASCII data, not A53 format. Lucent technologies is working on this and will have a box that accommodates A53 by the end of January 1997. Although Phillips is not currently working on the other side of the issue, their RS232 extraction of data from the signal delivers the entire User Data stream and does not separate out the caption data even though this is accessed through the RS232 access port.

Jim McKinney and Paul Lyons will contact Phillips to see if they can get Phillips to adopt the A53 standard for data extraction for captioning and strip the data out for use.

Demonstrating ATV captions over video could be difficult to implement since no decoding circuitry chips exist to perform this function in the receiver. George Hanover volunteered to try to get this accomplished. Another, near-term solution, might be to use the RGB monitor currently being used in the model stations demonstrations. This would require the RGB feeding the monitor to feed a computer first and overlaying the caption text over the video to display the captions over video. This might be further investigated with Ultech.

Although briefly discussed, it seemed that obtaining ATVCC funding from model station could be difficult to obtain. It might be more easily obtained from EIA. The work of Mark Dale would be used to feed caption data to the Lucent equipment in A53 format. The data extracted from the system could be extracted from the Phillips equipment once properly extracted. This could then feed the Drake Smith hardware.

A letter will be written to Jim McKinney thanking him for his time and asking that communications be ongoing.

**Market Research Update:** No further progress at this time.

**FMT/Caption Directory Index:** Bernie will be calling a meeting of those that submitted comments to his mail inquiry.

**MISSION STATEMENT:** TDSS mission statement was voted and approved.

**SUBTITLING:** T3 created a special taskforce to determine whether ATSC should do something about subtitling. The working group recommended against doing anything at this time. The executive committee of ATSC did not agree with the decision. A new committee was formed called T3S13. They have had three meetings. The committee has not yet discussed subtitling but will. Surge Ruttman from Intel chairs the committee.

**DVD:** Sony said that their currently proposed DVD players pass line 21. Thompson said that their first generation players do not.

**EMERGENCY MESSAGING**

A meeting was held to discuss Emergency Messaging. Mark Eyer and Kelley Williams were in attendance. There is discussions of moving the data from the user data to a separate data packet. Receiver manufactures will be asked whether they would prefer to have access to the Warsaw codes or full-text for these messages.

**NEW BUSINESS**

Darin Mortinsen of Toshiba asked that there be a delay in the violence blocking implementation date. Darin was asked to forward his request to Joe Peck of EIA.

EIA will develop a registry of undefined packets within XDS.

**NEXT MEETING** The next TDSS meeting will be January 8 in Las Vegas to coincide with CES.

**ADJOURNMENT** The meeting was adjourned at approximately 3:30 PM. It was conducted in accordance with the EIA Legal Guides and the Manual on Operation and Procedure.

Minutes prepared by Amnon Salomon, December 17.

Draft

## 1/2/97 - Expansion of XDS to include the TV Parental Guidelines

To be added to section 6.5.1 Current Class

### 05h Program Rating

This packet includes two characters that contain information about the program's MPAA rating or the TV Parental Guidelines. These two systems are mutually exclusive, so if one is included the other shall not be. Bit 6 of both characters shall be set high.

Character	b6	b5	b4	b3	b2	b1	b0
MPAA Rating	1	0	0	a0	r2	r1	r0
TV Parental Guidelines	1	0	0	t0	g2	g1	g0

If the bit a0 is high the MPAA picture rating is to be used unless the TV Parental Guideline system is in use (e.g. t0, g2, g1, and or g0 high).

The three bits r0-r2 are used to encode the MPAA picture rating if used.

r2	r1	r0	Rating
0	0	0	N/A
0	0	1	"G"
0	1	0	"PG"
0	1	1	"PG-13"
1	0	0	"R"
1	0	1	"NC-17"
1	1	0	"X"
1	1	1	Not Rated

A distinction is made between N/A and Not Rated. When all zeros are specified (N/A) it means that motion picture ratings are not applicable to this program (e.g. programs with TV Parental Guidelines). When all ones are used (Not Rated) it indicates a motion picture that did not receive a rating for a variety of possible reasons.

Bit t0 high indicates that the program has been considered for a TV Parental Guideline, however a TV Parental Guideline may not be applicable.

If the bit t0 is high or if any of the g bits is high, the TV Parental Guideline system shall be active.

Draft

## 1/2/97 - Expansion of XDS to include the TV Parental Guidelines

Bits g0-g2 in the second character are used to indicate the TV Parental Guidelines if used.

g2	g1	g0	Rating
0	0	0	N/A
0	0	1	"TVY"
0	1	0	"TVY7"
0	1	1	"TVG"
1	0	0	"TVPG"
1	0	1	"TV14"
1	1	0	"TVM"
1	1	1	Not Rated

Definition of symbols:

**N/A** indicates that the TV Parental Guideline is not applicable to this show. News and sports do not receive Guidelines.

**TVY All Children.** *This program is designed to be appropriate for all children.* Whether animated or live-action, the themes and elements in this program are specifically designed for a very young audience, including children from ages 2 -6. This program is not expected to frighten younger children.

**TVY7 Directed to Older Children.** *This program is designed for children age 7 and above.* It may be more appropriate for children who have acquired the developmental skills needed to distinguish between make-believe and reality. Themes and elements in this program may include mild physical or comedic violence, or may frighten children under the age of 7. Therefore, parents may wish to consider the suitability of this program for their very young children.

**TVG General Audience.** *Most parents would find this program suitable for all ages.* Although this rating does not signify a program designed specifically for children, most parents may let younger children watch this program unattended. It contains little or no violence, no strong language and little or no sexual dialogue or situations.

**TVPG Parental Guidance Suggested.** *This program may contain some material that some parents would find unsuitable for younger children.* Many parents may want to watch it with their younger children. The theme itself may call for parental guidance. The program may contain infrequent coarse language, limited violence, some suggestive sexual dialogue and situations.



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## 1/2/97 - Expansion of XDS to include the TV Parental Guidelines

**TV14 Parents Strongly Cautioned.** *This program may contain some material that many parents would find unsuitable for children under 14 years of age. Parents are strongly urged to exercise greater care in monitoring this program and are cautioned against letting children under the age of 14 watch unattended. This program may contain sophisticated themes, sexual content, strong language and more intense violence.*

**TVM Mature Audience Only.** *This program is specifically designed to be viewed by adults and therefore may be unsuitable for children under 17. This program may contain mature themes, profane language, graphic violence and explicit sexual content.*

**Not Rated** This is a program which does not fall into the categories of programs which will not be rated (i.e. news and sports), yet for some reason has not received a rating.

All program content analysis is the function of parties involved in program production or distribution.

This packet shall have a high repetition rate.

The data within this packet should be cleared or updated upon a change of the information contained in the Current Class Program Identification Number and/or Program Name packets.

The data within this packet shall not change during the course of a program, which shall be construed to include commercials, promotions, and station identifications.

### Current Class Packet 0Ch Composite Packet-1

References in this section to rating shall be increased to a length of 2, references to Program Type shall be increased to a length of 6, and the title field shall be reduced to a variable length of 0 to 20 bytes.

### Replacement of Section 6.6.2.5

#### 6.6.2.5

Bits 0-2 of the first data byte of this packet carry information about the MPAA rating of the program, while bit 3 indicates that this byte is in use.

The MPAA designations should only be used for programs that have been labeled as such by the MPAA. The N/A (Not Applicable) in the ratings category should be used by all programs that would not normally be rated by the MPAA. In this case bit 3 should be low. The N/R designation would

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PP 3 of 5

Exhibit 15 Page 437

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## 1/2/97 - Expansion of XDS to include the TV Parental Guidelines

apply only for a motion picture (or version of a motion picture) not rated by the MPAA (Motion Picture Association of America)

Bits 0-2 of the second data byte of this packet carry information about the TV Parental Guidelines of the program while bit 3 indicates that this is a program for which Guidelines should be considered (e.g. any program meant for over the air broadcast or cablecast except MPAA rated movies for cablecast).

If any of bits 0-3 of the second byte of this packet are high, the TV Parental Guidelines information shall be used and not the MPAA ratings information, even if present.

These bytes are included in Composite 1 packet.

### New Section 8.20

#### Viewer Control by XDS TV Parental Guidelines

Receivers may be designed which act on the XDS Program Rating Packet by informing consumers appropriately or by blocking selected program content. If the receiver is designed with a blocking feature based on the TV Parental Guidelines information bits in the XDS Program Rating Packet (see Section 6.5.1), the following actions are mandatory.

When the blocking mechanism is triggered in accordance with the TV Parental Guidelines selected by the user, the receiver shall do all of the following:

- mute the program audio
- render the video indecipherable - black screen is not acceptable
- eliminate program-related captions.

The receiver must display information relevant to the action taken and may optionally display other XDS data.

If an XDS Program Rating Packet has not been received within 9 seconds the receiver shall unblock.

If the channel is changed the receiver shall unblock.

The receiver shall power on in the unblocked state.

Draft

## 1/2/97 - Expansion of XDS to include the TV Parental Guidelines

Receivers which include a blocking feature shall include the following method of enabling this feature. While nothing shall preclude the use of other methods of blocking, this method must be included if the set is to be labeled "Blocks using TV Parental Guidelines"

- The remote control (control panel) shall have an unshifted button labeled "Guidelines"
- Pushing the Guidelines button shall cause a display requesting the password. (Method of setting password is receiver dependent).
- A password of at least 4 digits must be entered followed by pushing the Guidelines button.
- If the proper password is entered a display consisting of a vertical column of the 6 different TV Parental Guideline levels shall be displayed with TVM at the top and TVY at the bottom, above TVM shall be a seventh choice of UNBLOCK.
- Using the channel up/down buttons, a cursor may be moved up and down this column.
- When the cursor is on a specific level, and the Guidelines button is pushed the set shall block the level the cursor was on and all higher levels.
- If the cursor is on the choice of UNBLOCK when the Guidelines button is pushed, the set will be unblocked.
- This method of blocking programs shall not be used to block either Not/Applicable or Not Rated programs.
- If desired a second column, with a second cursor, containing the MPAA ratings may appear on the above screen at the same time. The user may shift from one column to the next using the volume up/down buttons.

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PP 5 of 5

Exhibit 15 Page 439

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PP 2 of 5

Exhibit 15 Page 441

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PP 5 of 5

Exhibit 15 Page 444

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**Consumer Electronics Manufacturers Association**  
**A sector of the Electronic Industries Association**  
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**1997 WCES  
NOTICE OF MEETING**

**ORGANIZATION:** Television Data Systems Subcommittee (R-4.3)

**CHAIRMAN:** Steve Sigman  
Zenith Electronics

**SECRETARY:** George Hanover  
CEMA Engineering

**MEETING LOCATION:** 1997 Winter Consumer Electronics Shows  
Las Vegas Hilton  
3000 Paradise Road  
Room - Conference 13 - 14  
Las Vegas, Nevada

**MEETING TIME:** 10:00 AM - 4:00 PM

**MEETING DATE:** Tuesday, January 7, 1996

It is important to R.S.V.P (for planning purposes) to Tenia Burton via FAX at 703 907-7601 or email [teniab@eia.org](mailto:teniab@eia.org). If you have any further questions, you may contact me on 703 907-7625.

Yes \_\_\_ / I will attend

EMAIL \_\_\_\_\_

☐ I do not have an e-mail address

NAME \_\_\_\_\_ COMPANY: \_\_\_\_\_

TEL: \_\_\_\_\_ FAX: \_\_\_\_\_

\*\*\*\*\* The Sponsor and Producer of The Consumer Electronics Shows

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**cc:Mail for: Richard Lowell**

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**Subject:** Proposed Agenda for R-4.3 meeting January 7, 1997  
**From:** Maxine Stone <maxines@eia.org> at ccmall 12/30/96 5:42 PM  
**To:** Richard Lowell at SEL-SD-TVA

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The proposed agenda for the Television Data Systems Subcommittee (R-4.3) is attached. Previous meeting minutes will follow. Copies will be available at the meeting.

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Uuencoded File Attachment: R-4.3

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**PROPOSED AGENDA  
CONSUMER ELECTRONICS MANUFACTURERS ASSOCIATION  
TELEVISION DATA SYSTEMS SUBCOMMITTEE (R-4.3)**

**Las Vegas Hilton  
Conference Room 13-14  
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**PRESIDING CHAIRMAN:** Steve Sigman  
Zenith Electronics

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  - Emergency Messaging
  - CEMA directory of undefined packets
7. Mission Statement
8. New Business

---

cc:Mail for: Richard Lowell

---

Subject: Response to CEMA

▼ Forwarded: Richard Lowell 12/12/96 8:46 AM

----- Forwarded -----

Subject: Response to CEMA

From: shintani@tv.sony.co.jp (Peter Shintani) 12/12/96 12:40 PM

To: Richard Lowell at SEL-SD-TVA

To: Richard\_Lowell@ccmail.sgo.sony.com at ccmail

cc: shintani@tv.sony.co.jp (Peter Shintani) at ccmail

cc: usui@tv.sony.co.jp at ccmail

----- End of Forward -----

To: Kazuhiko Inagaki

To: Yoshi Ueno

To:

---

Subject: Response to CEMA

From: shintani@tv.sony.co.jp (Peter Shintani) at ccmail

Date: 12/12/96 12:40 PM

Richard:

Mr. Usui asked me to send you, Sony's stance re the CEMA questionnaire:

A) Until the specifications governing the rules for the delivery of the V block signal and the specifications for the TV receiver's response to the rating commands are both concretely fixed, it is impossible to give a cost estimate to implement a rating system. Basically, until the rating system specification is completed, it is nearly impossible for a manufacturer to develop the TV receiver's sw, especially the user interface which may require a larger ROM size in the main CPU, which will then increase the cost of the TV receiver.

B) The typical design cycle is 24 months, for a new model. The FCC should be aware.

C) Mr. Usui didn't have the time to indicate his opinion re this question. Below is my off the cuff response.

My opinion, is that Commission should permit the EIA, NCTA, Broadcasters, MPAA and other related groups to jointly work on the rating system. Once the rating system and the appropriate TV receiver response spec is fixed, the CE members should be allowed to determine a reasonable grace period after the broadcaster start transmitting the rating information before requiring manufacturers to support the rating system in actual products.

If anything is unclear, please feel free to phone or email me.

cc: Rick

RECIPIENT REF: Inagaki, Kazuhiko

TO FAX PHONE #: 6196730139

FROM: EIA-GA AHMAD

4 PAGES INCLUDING COVER SHEET  
MSG REF#: 9IJ00280.0022  
DATE/TIME: Dec 09, '96 14:22 (ET)

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Exhibit 15 Page 449

SONY0073824



**Consumer Electronics Manufacturers Association**  
**A sector of the Electronic Industries Association**

2500 Wilson Boulevard ■ Arlington, VA 22201-3834 USA  
 Tel 703/907-7600 ■ Fax 703/907-7601

## TELECOPIER COVER SHEET

[If you do not receive any of the following pages, please contact Elizabeth Ahmad at: 703/907-7612]

TOTAL # OF PAGES: 3 (including cover sheet)

### TV/VCR Manufacturers Caucus

	<u>COMPANY</u>	<u>NAME</u>	<u>TELEPHONE</u>	<u>TELECOPIER</u>
TO:	Emerson	Barry Light	201/428-2091	201/428-2102
	Go-Video, Inc.	Edward Brachocki	602/998-3400	602/951-4404
	Hitachi	Jack Fuhrer	609/520-1320	609/520-8953
	Hitachi	Kuniaki (Kuni) Miura	770/279-5661	770/279-5674
	Hitachi	Bruce Schoenegge	770/279-5612	770/279-5689
	JVC Industrial America, Inc.	David Kline	201/794-3910	201/794-1579
	JVC Corporation	Clark Yoshida	201/703-4087	201/703-4098
	LG Electronics, U.S.A., Inc.	Michael Williamson	201/816-2330	201/816-2170
	MECA	Mary Alexander/ Paul Schomburg	202/223-2575	202/223-2614
	MECA	Don Lowry	847/439-1387	847/439-1387
	MECA	David Naranjo	201/392-4336	201/348-7807
	MECA	Jack Pluckhahn	770/338-6465	770/338-6506
	Mitsubishi Electronics America	Dave Broberg	770/734-5449	770/734-5352
	Mitsubishi Electronics America	Bob Meuser	202/337-9463	202/337-3639
	Mitsubishi Elec. America	Pete Salavantis	202/223-3424	202/775-0116
	Mitsubishi Elec. America	Michael Spiekerman	770/734-5404	770/368-4816
	Panasonic Technologies, Inc.	Judson Hofmann	609/734-7589	609/987-0201
	Philips CEC	Thomas Hafner	423/521-4322	423/521-4330
	Philips CEC	Skeet Jernigan	423/521-3409	423/521-3252
	Philips CEC	Frank Kot	423/602-3269	423/602-3100
	Philips CEC	Tim Logsdon	423/521-4433	423/521-4308
	Philips CEC	William Miller	423/521-4784	423/521-3650
	Philips Electronics	Tom Patton	202/962-8550	202/962-8560
	Philips CEC	Brian Smith	423/602-3002	423/602-3024
	Philips CEC	Gerry Wirtz	31-40-73-46-73	31-40-73-44-26
	Pioneer Electronics	Michael Fidler	310/952-2401	310/952-2943
	Samsung Electronics	Jun Ho Ahn	201/229-4154	201/229-4177
	Samsung Electronics	Kevin Procter	201/229-4010	201/229-4019
	Sanyo Fisher	Donna Houska/ Herbert Lippold	818/998-7322	818/701-4145
	Sanyo Manufacturing Corp.	Jack Armstrong	501/633-5030	501/633-0650

TV/VCR Manufacturers Caucus (Continued):

<u>COMPANY</u>	<u>NAME</u>	<u>TELEPHONE</u>	<u>TELECOPIER</u>
Sharp Electronics Corp.	Richard Long/	201/529-9689	201/529-9642
	Wayne Myrick	201/529-9299	
Sharp Electronics Corp.	Werner Wedam	201/529-8618	201/529-9141
Sharp Electronics Corp.	Robert Walsh	201/529-8611	201/512-2004
Sony Corporation	Kazuhiko Inagaki	619/673-3205	619/673-0139
Sony Electronics, Inc.	Jim Bonan	201/930-7924	201/930-7937
Sony Electronics, Inc.	Jason Farrow	201/930-6440	201/358-4058
Squire, Sanders & Dempsey	Marc Berejka	202/626-6209	202/626-6780
Thomson Consumer Electronics	Bruce Allan	202/872-0670	202/872-0674
Thomson Consumer Electronics	Bill Beyers	317/587-3264	317/587-6779
Thomson Consumer Electronics	Harold Blatter	317/587-4208	317/587-9209
Thomson Consumer Electronics	Joe Clayton	317/587-3767	317/587-6703
Thomson Consumer Electronics	Ahmet Eskicioglu	317/587-5005	317/587-9494
Thomson Consumer Electronics	Wray Hiser	317/587-3910	317/587-6727
Thomson Consumer Electronics	W.A. Lagoni	317/587-4029	317/587-6770
Thomson Consumer Electronics	Ed Milbourn	317/587-3035	317/587-6713
Thomson Consumer Electronics	Mary Mykyta	317/587-3676	317/587-9676
Thomson Consumer Electronics	Mehmet Ozkan	317/587-3969	317/587-9969
Thomson Consumer Electronics	Randall Staggs	317/587-4129	317/587-6704
Toshiba Am. Consumer Prod.	Robert Arnett	615/444-8501	615/443-3810
Toshiba Am. Consumer Prod.	Greg DePriest	609/951-8500	609/951-9172
Toshiba Manufacturing Plant	Yuichi Sakaguchi	615/444-8501	615/449-1531
Wiley, Rein & Fielding	Bruce Joseph	202/429-7258	202/429-7049
Zenith Electronics Corp.	Rick Auld	847/391-7308	847/391-8084
Zenith Electronics Corp.	Vito Brugliera	847/391-7910	847/391-8569
Zenith Electronics Corp.	Jeff Puskas	847/391-7400	847/391-7345
Zenith Electronics Corp.	Steve Sigman	847/391-8163	847/391-7172
Zenith Electronics Corp.	John Taylor	847/391-8181	847/391-8334

FROM: Joe Peck, Tom Mock

CC: Gary Shapiro  
George Hanover

DATE: December 9, 1996

RE: FCC's QUESTIONS ON V-CHIP

See attached memo.



Consumer Electronics Manufacturers Association  
A sector of the Electronic Industries Association  
2500 Wilson Boulevard ■ Arlington, VA 22201-3834 USA  
Tel 703/907-7600 ■ Fax 703/907-7601

## MEMORANDUM

TO: TV/VCR Manufacturers Caucus, R4 Committee

FROM: Joe Peck  
Tom Mock

DATE: December 9, 1996

RE: FCC's Questions on V-Chip

CEMA was recently contacted by the FCC to inquire further into CEMA's efforts regarding a standard for transmission of program content codes on line 21 of the VBI. The following are the noteworthy items from that exchange.

1. The Commission seems impatient to accomplish V-Chip implementation.
2. The Chairman's office is fully engaged in this issue.
3. The Commission staff seems to favor a V-Chip scenario which will include the V-Chip mandatory accommodation of multiple ratings systems rather than just one (MPAA, cable, TV).
4. The Commission seemed interested in ensuring that the ratings system data which is encoded and sent with the picture information is protected under all transmission scenarios.

The Commission staff also had several questions for CEMA.

- A. What would a V-Chip cost to implement which accommodates a movie (MPAA), cable (ex. HBO) and MPAA-like TV ratings system?
- B. What product cycle realities and key product cycle dates should the FCC be aware of in considering establishment of an effective date for the V-Chip mandate?
- C. How should the Commission handle the timing for approval of a ratings system and the establishment of the technical specs for V-Chip?

As CEMA drafts a response to the above questions, we request your input on each. Please fax us your thoughts in writing no later than December 13, 1996, at (703) 907-7693.

..... The Sponsor and Producer of The Consumer Electronics Shows





January 9, 1997

cc: Rick

COMMISSION PROPOSES RULES FOR VIDEO CLOSED CAPTIONING  
(MM Docket 95-176)

The Commission has adopted a proposal to establish rules to implement Section 305 of the Telecommunications Act of 1996 ("1996 Act") which generally requires that video programming be closed captioned to ensure access to video programming by persons with hearing disabilities.

Closed captioning is a technology that assists viewers by identifying spoken words, and may identify things like speakers, sound effects, music and laughter. A viewer wishing to see the closed captioning must use a set top decoder or a television with a built-in decoder. It is estimated that between 50 and 60 million US homes can currently receive closed captioning. Currently, the majority of programming on each of the commercial broadcast networks is closed captioned, while nearly 30% of the prime time programming on the top 20 basic cable networks and over 60% on the top six premium networks is closed captioned. Digital transmission systems under development are being designed to include closed captioning capabilities.

The 1996 Act requires the Commission to prescribe, by August 8, 1997, rules and implementation schedules for captioning of video programming. Congress generally required that video programming be closed captioned, regardless of distribution technology, to ensure access to persons with hearing disabilities. Congress also recognized that in some situations requiring that programming be closed captioned might prove to be an undue burden on video programming providers or owners. Accordingly, Congress authorized the Commission to adopt as part of its rules provisions exempting classes of programs or services for which provision of video programming would be economically burdensome. Congress also exempted programming providers or owners from any closed captioning requirements if providing closed captioning would be inconsistent with contracts in effect on the date the 1996 Act was enacted. Finally, Congress permitted video programming providers and owners to petition the Commission for an exemption from the closed captioning requirements by demonstrating that the requirements constituted an undue burden.

Some of the key elements in the Notice adopted today include:

A proposal that those entities delivering video programming directly to consumers (i.e., television broadcasters and multichannel video programming distributors ("MVPDs")) be ultimately responsible for compliance with the closed captioning rules we adopt. The Commission believes, however, that producers generally will have the responsibility for captioning programming regardless of who has the obligation to comply with the rules.

A proposed transition schedule for new programming requiring that all non-exempt, new programming be closed captioned within eight years. The Commission proposes to phase in this captioning requirement by increasing the amount of required captioning by 25% every two years. Thus, 25% of such programming would be required to be captioned at the end of the second year, 50% at the end of the fourth year, 75% at the end of the sixth year, and all non-exempt, new programming by the end of the eighth year. Alternatively, comment is sought on a ten year period with 25% captioned after three years, 50% after five years, 75% after seven years, and 100% after ten years.

A discussion on how to ensure that programming providers or owners "maximize the accessibility" of programming first published or exhibited before the effective date of our rules. The Commission seeks comment on whether the rules should require that a percentage of library programming (e.g., 75%) ultimately be captioned and seeks comment on what deadline should apply. Comment is also sought on whether a more flexible approach should be adopted.

A discussion of exemptions where the economic burden of captioning programming outweighs the benefits to be derived from captioning and, in some cases, the complexity of adding the captioning. The Commission seeks comment on whether a definition of economic burden should be based on relative market size, degree of distribution, audience rating or share, relative programming budgets or revenue base, repeat value, or a combination of factors. The Commission does not propose to exempt any class of provider

since all classes of providers appear to have the technical capability to deliver closed captioning to their viewers intact.

The tentative conclusion that programming subject to contracts in effect on the date of enactment of the 1996 Act (i.e., February 8, 1996) that specifically prohibit closed captioning should be exempt from any captioning requirement. Comment is sought on other types of contract provisions that may be inconsistent with captioning.

A discussion of the factors the Commission will consider, the showing a petitioner must make, and the procedural mechanisms associated with, individual petitions for undue burden exemptions.

A proposed complaint process for enforcement of the closed captioning rules adopted.

Action by the Commission January 9, 1997, by Notice of Proposed Rulemaking (FCC 97-4). Chairman Hundt, Commissioners Quello, Ness and Chong.

- FCC -

News Media Contact: Morgan Broman at (202) 418-2358  
Cable Services Bureau Contact: Marcia Glauber at (202) 418-7200

Rick

# FCC Closed-Captioning Rule Could Prove Costly

By TED HEARN

WASHINGTON — The Federal Communications Commission is planning to impose closed-captioning mandates on the cable industry that could cost \$7.2 billion over eight years.

Under the Telecommunications Act of 1996, the FCC is required to order all video distributors and programmers to provide closed captioning — which includes subtitles for spoken words, music, laughter and sound effects — in order to accommodate the hearing-impaired.

Last week, the FCC, in a 4-0 vote, proposed phasing in the requirement over the next eight years for all new programming. Every two years, 25 percent of all new programming would have to be captioned. Alternatively, the FCC proposed a 10-year transition with a similar phase-in.

"This notice proposes an aggressive schedule for implementing closed captioning," FCC chairman Reed Hundt said.

New programming is defined as programming published or exhibited after the effective date of the FCC's rules, covering sports, news, documentaries and movies.

Program producers will be

responsible for the captioning, but cable operators and networks will bear the ultimate responsibility of ensuring that FCC rules are being followed. TV broadcasters are also covered by the proposed rules.

In a statement, National Cable Television Association pres-

## Exempt programming must meet one of two standards.

ident Decker Anstrom vowed cooperation with the FCC, but he urged the agency "to recognize the challenges that face the diverse cable programming industry."

Last year, the NCTA told the FCC that closed-captioning of basic programming alone would cost between \$500 million and \$900 million a year, equal to about one-third of annual spending by all basic cable programmers. Under an eight-year transition, closed captioning would cost \$7.2 billion.

"I'm not aware of any cost studies on what it would cost the industry," said Meredith

Jones, chief of the FCC's Cable Services Bureau.

The NCTA said captioning costs for new programming run about \$1,500 an hour, and costs for live programming run between \$600 and \$750 an hour.

In examining the current availability of closed captioning, the FCC found that 4 percent of basic cable programming was in a closed caption format. The NCTA said the FCC's data understated the basic cable captioning availability by 20 percentage points, and by 36 percentage points if only primetime programming were being examined.

The FCC's proposed mandate also covers "old," or "library," programming. As a goal, the FCC proposed that 75 percent of all library programming be closed-captioned within 10 years.

The NCTA had urged the FCC to make closed captioning of library programming voluntary, due to cost considerations, and the association warned that a captioning mandate for such programming could "relegate older movies and series permanently to the archives."

The rules will allow some programming to be exempt based on two standards, one of which is an undue economic burden.

The FCC said exemptions might be granted based on the

captioning costs and the financial resources of the program provider, among other things.

Programming contracts signed before Feb. 8, 1996, that barred closed captioning would be exempt from the mandate, the FCC said.

Jones indicated that it was possible that home shopping channels and weather channels, both of which include textual formats as part of their service, could fit in under the

exemption. Besides those formats, the NCTA had urged the FCC to consider exemptions for preview and courtroom channels.

The FCC said between 50 million and 60 million U.S. households have either set-top decoders or decoder-equipped TVs capable of displaying closed-captions.

By law, the FCC must adopt closed captioning rules by Aug. 8.

## Comcast Adds @Home in Sarasota, Fla.

SARASOTA, Fla. — Comcast Corp. has begun to sell Comcast@Home high-speed Internet access in the Sarasota area, the second such Comcast launch after Baltimore. The service will cost \$39.95 per month for cable customers and \$59.95 per month for customers who don't subscribe to cable service. Launching in 1995, after a \$95 temporary promotion, the service is available in portions of Sarasota and Manatee counties where the company has completed fiber optic upgrades.

Content for the service will be provided by @Home Network and by Comcast, which manages a local information site called Sarasota.com. Comcast also said it has signed partnership agreements with local media and other content providers.

Other Comcast services scheduled for @Home launches in the first half of 1996 include northern New Jersey, suburban Philadelphia, Detroit and Orange County, California.

1/13/97 Multichannel News.

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**cc:Mail for: Richard Lowell**

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**Subject:** Sony rep on Valenti group  
**From:** Kelly Williams <kwilliam@nab.org> at ccmail 1/14/97 2:07 PM  
**To:** Richard Lowell at SEL-SD-TVA

---

Richard,

Here is the contact information for the Sony Rep on the Valenti group.

Alicia Smith  
Sr. Vice President  
Smith-Free Group  
representing Sony Pictures Ent.  
1500 K St NW suite 325  
Wash. D.C. 20005  
202-393-4760 (v)  
202-393-3516 (f)

Best regards,

Kelly

Virginia Bartlett      1/22/97  
Sony  
201 930 6238

www.tvguidelines.org

www.fcc.gov

Draft  
1/2/97 - Expansion of XDS to include the TV Parental Guidelines

To be added to section 6.5.1 Current Class

05h Program Rating

This packet includes two characters that contain information about the program's MPAA rating or the TV Parental Guidelines. These two systems are mutually exclusive, so if one is included the other shall not be. Bit 6 of both characters shall be set high.

Character	b6	b5	b4	b3	b2	b1	b0
MPAA Rating	1	0	0	a0	r2	r1	r0
TV Parental Guidelines	1	0	0	t0	g2	g1	g0

*✓ V/L/S (3 Level)*  
If the bit a0 is high the MPAA picture rating is to be used unless the TV Parental Guideline system is in use (e.g. t0, g2, g1, and or g0 high).

*TV Pm Guide*  
The three bits r0-r2 are used to encode the MPAA picture rating if used.

r2	r1	r0	Rating
0	0	0	N/A
0	0	1	"G" -
0	1	0	"PG" -
0	1	1	"PG-13"
1	0	0	"R"
1	0	1	"NC-17"
1	1	0	"X"
1	1	1	Not Rated

*(or TVY)*  
*(or TVY7)*

*TVM*

A distinction is made between N/A and Not Rated. When all zeros are specified (N/A) it means that motion picture ratings are not applicable to this program (e.g. programs with TV Parental Guidelines). When all ones are used (Not Rated) it indicates a motion picture that did not receive a rating for a variety of possible reasons.

Bit t0 high indicates that the program has been considered for a TV Parental Guideline, however a TV Parental Guideline may not be applicable.

If the bit t0 is high or if any of the g bits is high, the TV Parental Guideline system shall be active.

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## 1/2/97 - Expansion of XDS to include the TV Parental Guidelines

Bits g0-g2 in the second character are used to indicate the TV Parental Guidelines if used.

g2	g1	g0	Rating
0	0	0	N/A
0	0	1	"TVY"
0	1	0	"TVY7"
0	1	1	"TVG"
1	0	0	"TVPG"
1	0	1	"TV14"
1	1	0	"TVM"
1	1	1	Not Rated

Definition of symbols:

**N/A** indicates that the TV Parental Guideline is not applicable to this show. News and sports do not receive Guidelines.

**TVY All Children.** *This program is designed to be appropriate for all children. Whether animated or live-action, the themes and elements in this program are specifically designed for a very young audience, including children from ages 2 -6. This program is not expected to frighten younger children.*

**TVY7 Directed to Older Children.** *This program is designed for children age 7 and above. It may be more appropriate for children who have acquired the developmental skills needed to distinguish between make-believe and reality. Themes and elements in this program may include mild physical or comedic violence, or may frighten children under the age of 7. Therefore, parents may wish to consider the suitability of this program for their very young children.*

**TVG General Audience.** *Most parents would find this program suitable for all ages. Although this rating does not signify a program designed specifically for children, most parents may let younger children watch this program unattended. It contains little or no violence, no strong language and little or no sexual dialogue or situations.*

**TVPG Parental Guidance Suggested.** *This program may contain some material that some parents would find unsuitable for younger children. Many parents may want to watch it with their younger children. The theme itself may call for parental guidance. The program may contain infrequent coarse language, limited violence, some suggestive sexual dialogue and situations.*

Warner W. Johnston  
(212) 456-2546

ABC-TV  
johnstw@abc.com

PP 2 of 5

Exhibit 15 Page 458

SONY0073833

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## 1/2/97 - Expansion of XDS to include the TV Parental Guidelines

**TV14 Parents Strongly Cautioned.** *This program may contain some material that many parents would find unsuitable for children under 14 years of age. Parents are strongly urged to exercise greater care in monitoring this program and are cautioned against letting children under the age of 14 watch unattended. This program may contain sophisticated themes, sexual content, strong language and more intense violence.*

**TVM Mature Audience Only.** *This program is specifically designed to be viewed by adults and therefore may be unsuitable for children under 17. This program may contain mature themes, profane language, graphic violence and explicit sexual content.*

**Not Rated** This is a program which does not fall into the categories of programs which will not be rated (i.e. news and sports), yet for some reason has not received a rating.

All program content analysis is the function of parties involved in program production or distribution.

This packet shall have a high repetition rate.

The data within this packet should be cleared or updated upon a change of the information contained in the Current Class Program Identification Number and/or Program Name packets.

The data within this packet shall not change during the course of a program, which shall be construed to include commercials, promotions, and station identifications.

### Current Class Packet 0Ch Composite Packet-1

References in this section to rating shall be increased to a length of 2, references to Program Type shall be increased to a length of 6, and the title field shall be reduced to a variable length of 0 to 20 bytes.

### Replacement of Section 6.6.2.5

#### 6.6.2.5

Bits 0-2 of the first data byte of this packet carry information about the MPAA rating of the program, while bit 3 indicates that this byte is in use.

The MPAA designations should only be used for programs that have been labeled as such by the MPAA. The N/A (Not Applicable) in the ratings category should be used by all programs that would not normally be rated by the MPAA. In this case bit 3 should be low. The N/R designation would

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## 1/2/97 - Expansion of XDS to include the TV Parental Guidelines

apply only for a motion picture (or version of a motion picture) not rated by the MPAA (Motion Picture Association of America)

Bits 0-2 of the second data byte of this packet carry information about the TV Parental Guidelines of the program while bit 3 indicates that this is a program for which Guidelines should be considered (e.g. any program meant for over the air broadcast or cablecast except MPAA rated movies for cablecast).

If any of bits 0-3 of the second byte of this packet are high, the TV Parental Guidelines information shall be used and not the MPAA ratings information, even if present.

These bytes are included in Composite 1 packet.

### New Section 8.20

#### Viewer Control by XDS TV Parental Guidelines

Receivers may be designed which act on the XDS Program Rating Packet by informing consumers appropriately or by blocking selected program content. If the receiver is designed with a blocking feature based on the TV Parental Guidelines information bits in the XDS Program Rating Packet (see Section 6.5.1), the following actions are mandatory.

When the blocking mechanism is triggered in accordance with the TV Parental Guidelines selected by the user, the receiver shall do all of the following:

- mute the program audio
- render the video indecipherable - black screen is not acceptable
- eliminate program-related captions.

The receiver must display information relevant to the action taken and may optionally display other XDS data.

If an XDS Program Rating Packet has not been received within 9 seconds the receiver shall unblock.

If the channel is changed the receiver shall unblock.

The receiver shall power on in the unblocked state.



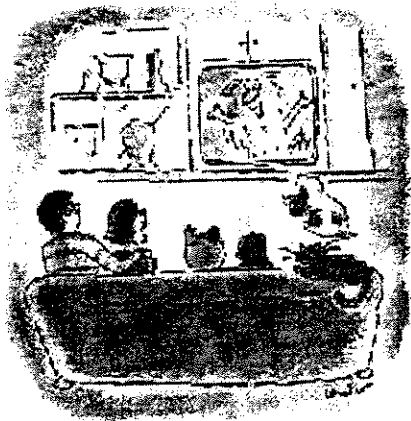
Draft

## 1/2/97 - Expansion of XDS to include the TV Parental Guidelines

Receivers which include a blocking feature shall include the following method of enabling this feature. While nothing shall preclude the use of other methods of blocking, this method must be included if the set is to be labeled "Blocks using TV Parental Guidelines"

- The remote control (control panel) shall have an unshifted button labeled "Guidelines"
- Pushing the Guidelines button shall cause a display requesting the password. (Method of setting password is receiver dependent).
- A password of at least 4 digits must be entered followed by pushing the Guidelines button.
- If the proper password is entered a display consisting of a vertical column of the 6 different TV Parental Guideline levels shall be displayed with TVM at the top and TVY at the bottom, above TVM shall be a seventh choice of UNBLOCK.
- Using the channel up/down buttons, a cursor may be moved up and down this column.
- When the cursor is on a specific level, and the Guidelines button is pushed the set shall block the level the cursor was on and all higher levels.
- If the cursor is on the choice of UNBLOCK when the Guidelines button is pushed, the set will be unblocked.
- This method of blocking programs shall not be used to block either Not/Applicable or Not Rated programs.
- If desired a second column, with a second cursor, containing the MPAA ratings may appear on the above screen at the same time. The user may shift from one column to the next using the volume up/down buttons.

12/20/96.  
cc: Rick



## The TV Parental Guidelines

*Welcome to our site on the World Wide Web for parents interested in television for their children!*

### Topics

- [We thought you'd like to know](#)
- [Parental Guidelines](#) (click here to see the full guidelines)
- [Special Categories for Children](#)
- [Parental Responsibility](#)
- [Additional Resources](#)
- [Additional Resources for Broadcasters](#)

### We thought you'd like to know . . .

Up to 2,000 hours of television are available in American homes each day. To help parents sort through this huge volume of material and choose programs they want their young children to see — or not to see — the entire television industry has developed **TV PARENTAL GUIDELINES**. These Guidelines have one objective: To offer parents some advance cautionary information so they can better supervise the TV watching of their young children.

The Parental Guidelines are modeled after the familiar movie ratings which parents have known and valued for nearly 30 years. They are designed to be simple to use, easy to understand and handy to find.

## The TV Parental Guidelines

### Here's How the Guidelines Work

TV PARENTAL GUIDELINES apply to all television programs, including those directed specifically to young children. Sports and news shows will not carry the Guidelines.

Finding the Parental Guidelines is as simple as opening your daily newspaper, or *TV Guide*, or turning on your TV set. Publications will offer the Guidelines along with other programming information. The Guidelines will appear at the beginning of each show.

Because of the vast amount of daily TV programs, networks/producers of each show will determine the Parental Guidelines for that show. An OVERSIGHT MONITORING BOARD will be formed from a broad range of experts drawn from the television industry. The Board's mandate is to make sure that there is as much uniformity and consistency in applying the Parental Guidelines as is possible. The Board will examine programs whose Guidelines may have been inappropriate and will review publically criticized programs to ensure the accuracy of the Guidelines.



## Special Categories for Children's Programs

After meeting with and listening to scores of parental, medical, religious, child advocacy and educational organizations, special emphasis has been placed on programs directed specifically to children. Two categories of CHILDREN'S GUIDELINES have been created: one identifying programs and suitable for children of all ages, and a second category informing parents these programs are designed for children older than 7 years, who are better able to distinguish between make-believe and reality.

## Parental Responsibility

Parental responsibility is indispensable in making the Guidelines work. Not only should parents become familiar with the TV PARENTAL GUIDELINES they should also become knowledgeable about information provided by other organizations. The more parents know about TV, the better decisions they can make for their children.



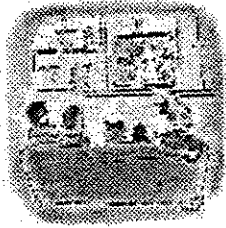
For further information write or call:



TV PARENTAL GUIDELINES  
OVERSIGHT MONITORING BOARD  
P.O. BOX 14097  
WASHINGTON, DC 20004  
202/879-9364



Contact: Webmaster, Brian Savoie at [bsavoie@nab.org](mailto:bsavoie@nab.org).  
You are visitor #93 to this site today.



## The TV Parental Guidelines

The following categories apply to programs designed solely for children:



**TVY All Children.** *This program is designed to be appropriate for all children.* Whether animated or live-action, the themes and elements in this program are specifically designed for a very young audience, including children from ages 2-6. This program is not expected to frighten younger children.



**TVY7 Directed to Older Children.** *This program is designed for children age 7 and above.* It may be more appropriate for children who have acquired the developmental skills needed to distinguish between make-believe and reality. Themes and elements in this program may include mild physical comedic violence, or may frighten children under the age of 7. Therefore, parents may wish to consider the suitability of this program for their very young children.

The following categories apply to program designed for the entire audience.



**TVG General Audience.** *Most parents would find this program suitable for all ages.* Although this rating does not signify a program designed specifically for children, most parents may let younger children watch this program unattended. It contains little or no violence, no strong language and little or no sexual dialogue or situations.



**TVPG Parental Guidance Suggested.** *This program may contain some material that some parents would find unsuitable for younger children.* Many parents may want to watch it with their younger children. The theme itself may call for parental guidance. The program may contain infrequent coarse language, limited violence, some suggestive sexual dialogue and situations.



**TV14 Parents Strongly Cautioned.** *This program may contain some material that many parents would find unsuitable for children under 14 years of age.* Parents are strongly urged to exercise greater care in monitoring this program and are cautioned against letting children under the age of 14 watch unattended. This program may contain sophisticated themes, sexual content, strong language and more intense violence.



**TVM Mature Audience Only.** *This program is specifically designed to be viewed by adults and therefore may be unsuitable for children under 17.* This program may contain mature themes, profane language, graphic violence, and explicit sexual content.



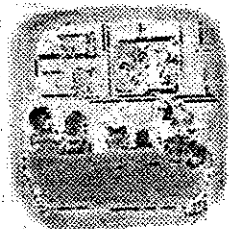
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# Children's TV - Lots of Good Answers to Lots of Good Questions

Rick Ducey

## SVP, Research and Information Group

Children's television has long been a controversial issue with many groups, involving everyone from major TV networks to local PTA and consumer organizations. The effect of television programming of all kinds on young viewers has been debated since the earliest days of TV in the home. Many of the questions posed by both critics and journalists are good ones, worthy of a considerate and reasoned response. Here are some of them:

Critic #1: Violence on television causes children to be violent.

Comeback #1: Yes, I'm concerned about too much violence in our society, too. Do you know that researchers think that values and practices in family life have a much bigger impact on kids than TV? In fact, according to the American Psychological Association Commission on Violence and Youth, the greatest predictor of future violent behavior is a previous history of violence and what kids learn about violence in various settings other than just television. To solve the violence problem, we must all work together to teach children at home, in school and in social life better attitudes, knowledge and behavior related to aggression.

Critic #2: The boob tube is making my kid fat and lazy.

Comeback #2: I agree that healthy children need to be active and stimulated by their environment. Think about it, television gets a bad rap, but reading is seen as good for kids. Yet both activities involve sitting quietly and probably snacking. Maybe what we should do with our kids is get them to supplement their reading and television time with more sports, family hikes, housework or other fun projects. And in fact, given the results of a recent study comparing American and Asian kids, this may already be happening. According to a University of Michigan study, U.S. students spend less time watching television and more time with sports and other activities than Japanese and Taiwanese kids.

Critic #3: Only dumb kids watch television.

Comeback #3: It's interesting to hear you say that because research done recently for the National Research Center on the Gifted and Talented child concludes just the opposite. Did you know that young, gifted children spend significantly more hours in front of the television set than their same-age peers? One major study even found that television viewing can actually strengthen reading and information processing skills. The issue is really not how much television kids watch, but what they watch and how involved they are with the programming. Hopefully you and other parents are helping them to decide on appropriate viewing selections and better yet, watching television and discussing it with them!

Critic #4: Children can't tell the difference between commercials and regular programming.

Comeback #4: Yes, you're right that some children are too young to understand the difference, in fact they really don't even understand the story lines in the programming all that well (let alone that commercials are trying to get them to buy something). But, as children get older, the research shows that it is important for children to learn that people have different points of view and will try to persuade them. Commercials are a fact of life that the vast majority of Americans accept in exchange for a source of free television programming. Also, as a matter of economics, children influence over \$40 billion of family purchases each year. The advertising they see may try to persuade them, but as with adults, it can also inform and motivate them to make wiser purchases.

Critic #5: TV makes my kids jumpy and inattentive.

Comeback #5: It is a tough problem sometimes to get kids to focus on things we want them to do, my friends who teach school tell me this all the time. What the researchers are telling us is that television actually tends to relax children under many conditions. However, even with the television on, children tend to do several things at once. It may be hard to figure out what is actually causing them to be jumpy. Their level of attention is affected by what they are watching and how interested they are in the program. In some cases, television actually improves task focus and perseverance!

Critic #6: I want my kid to be smarter, so I don't let her watch television.

Comeback #6: I'm sorry you feel that way, because there is a lot of quality programming on television that your child is missing out on. Research shows that television viewing can lead to better vocabulary, and better processing of visual information like pictures and body language, among other things. In any case, television viewing doesn't really displace valuable cognitive activities, according to the researchers. What kids do instead of watching television, tends to be things like going to movies, listening to radio, reading comic books or doing sports. Many kids do their homework while watching television, and studies show no difference in quality compared to kids not watching television.

Critic #7: TV is addictive for children.

Comeback #7: You know, it seems like there are several things going on. First, kids sometimes watch a lot of television to escape from the frustrations of poor school performance or frequent conflict with parents. Second, think about yourself and how you watch television. Remember, you are the most important role model for your kids. Child rearing practices, including rules for watching television also matter here. Third, television can help children cope with the stresses and strains in their lives. Once you add it up, as one researcher suggested, it's probably not psychological addiction at all that we're talking about. Heavy television viewing can instead better be understood as a child's response to models of behavior and pressures exerted by their social environments. If those pressures are lifted, their viewing habits may change.

Critic #8: There's nothing good on television for my children.

Comeback #8: Wow, that's really something to hear! Do you know that on the face of this earth there are no children more privileged or with greater access to the full diversity of what television has to offer than what we have right here in this country? Countries around the world are trying as hard as they can to copy what we already have here. On average, we get at least 36 channels of round the clock television on commercial, public and cable stations and networks, plus what's available at video stores, libraries and mail order houses. You couldn't dream of a richer television environment. Maybe what you're really saying is that it's hard to know what is good programming and then trying to find the time to watch it. Program guides and sitting down with your kids to pick out what to watch and then watching it with them will give you a much better idea of what's available and how good it is.

Critic #9: Children can't tell the difference between what's real and pretend on television.

Comeback #9: Of course it depends on what age ranges you are talking about, but generally children are reasonably sophisticated about this. You know, sometimes after I've been to a meeting with several people and hear their various versions of what just happened, I wonder if adults can tell the difference between real and imagined. Visual literacy is an important thing for kids to develop. Explanations or even demonstrations of how special effects work and the different narrative and editing techniques of storytelling will certainly improve kids' abilities to understand the difference between real and make-believe.

Critic #10: Okay, so what's your advice to me as a parent, what should I do about my kids and television?

Comeback #10: Well, first, thanks for your positive approach. What the leading researchers are telling us is that there are some good guidelines to help parents with their kids and television choices. First, make sure that the programming your kids watch is in line with their capabilities in terms of following story lines and plot development, but don't be afraid to challenge them. Younger kids will need more help understanding what story lines, commercials and special effects are all about, work with them and explain these things. Not all television programming is equal, you need to work to pick the programming that is right for you and your children. The very best thing you can do for your child, and researchers find this to be true again and again, is to spend the time to help them pick out what they are going to watch and then sit down and watch it with them and be open about discussing what they are seeing and thinking.

Critic #11: So, where can I find out about quality children's programming?

Comeback #11: Well, ask your local broadcasters or check out KidsNet on the World Wide Web at [www.kidsnet.org](http://www.kidsnet.org) or on CompuServe at "go kidsnet".

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cc:Mail for: Kazuhiko Inagaki

---

Subject: Video User Data

From: "Eyer; Mark (SD-MS)" <MEYER@GI.COM> at ccmail 1/20/97 2:27 PM

bcc: Kazuhiko Inagaki at SEL-SD-TVA

To: "SCTE\_DVS" <SCTE\_DVS@GI.COM> at ccmail

cc: "Glaab; Joseph (HT-MS)" <jglaab@gic.gi.com> at ccmail

cc: "Eyer; Mark (GI)" <MEYER@GI.COM> at ccmail

cc: "Moroney; Paul (SD-MS)" <PMORONEY@GI.COM> at ccmail

cc: "Nuber; Ray (SD-MS)" <RNUBER@GI.COM> at ccmail

cc: "Rast; Robert (SD-MS)" <RRAST@GI.COM> at ccmail

cc: "Narasimhan; Sam (SD-MS)" <SNARASIMHA@GI.COM> at ccmail

cc: "Anderson; Candy (SD-MS)" <CANDERSON@GI.COM> at ccmail

cc: "Mel Engel (Wavephore)" <mengel@wavephore.com> at ccmail

---

Rick

F.I.L.

The General Instrument position on video user data largely echoes the Thomson position.

We agree that the captioning data in the picture user data structure as defined in ASTC A/53 (and EIA-608/708) should be reserved for use in cable. Other methods of transmitting data of similar function should not be precluded.

We agree that the use of new data types within video user data should be discouraged unless the data is inseparable from the video content and unlikely to be replaced or modified.

An example of data that is inseparable from video and unlikely to be replaced or modified is NTSC VBI data. VBI data may be considered a part of the input video waveform that may be digitized, compressed, transported, and reconstructed with an NTSC output (when the video mode is NTSC format).

VBI data encoded in video user data syntax is carried only to allow reconstruction at a receiver of the full original NTSC waveform as it was input to the MPEG-2 encoder. Applications residing in digital receivers should receive their pertinent data via elementary stream components of a digital service (i.e. via separate PID streams).

The attached document is a proposed standard for carriage of VBI data within the A/53 user data syntax. The method is backward-compatible with hardware built to comply with the current definition in A/53. The document describes a compression method and syntax supporting the most important VBI standards in current use, including EIA-516 NABTS, WST, Nielsen SID/AMOL, VITC, as well as EIA-608 data carried on lines other than line 21.

---

Text Item

1

DVS-053

*cc: Rick*

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# VBI EXTENSIONS FOR THE ATSC DIGITAL TELEVISION STANDARD

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Revision: 1.0  
Date: 20 January 1997  
Document Number: STD-096-015

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**GI** General Instrument —

Exhibit 15 Page 470

SONY0073845

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Videa User Data DVS/053

Exhibit 15 Page 471

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# Contents

1. INTRODUCTION .....	1
1.1 Purpose.....	1
1.2 Revisions.....	1
1.3 Scope.....	1
2. APPLICABLE DOCUMENTS.....	3
3. ACRONYMS AND ABBREVIATIONS .....	5
4. VIDEO USER DATA EXTENSIONS .....	7
4.1 Closed Captioning .....	7
4.2 Nielsen SID/AMOL Signals .....	7
4.3 Other VBI Standards .....	7
5. PICTURE USER DATA SYNTACTIC EXTENSIONS .....	9
5.1 Syntax Conventions and Definitions .....	9
5.1.1 Method of Describing Bitstream Syntax .....	9
5.1.2 Reserved, Forbidden & Marker Bits .....	10
5.1.3 Mnemonics .....	11
5.1.4 Start Codes .....	11
5.1.5 Definition of Functions .....	11
5.2 Picture User Data Syntactic Extensions .....	11
6. PICTURE USER DATA SEMANTIC EXTENSIONS .....	13

## List of Figures

Figure 5-1. Next Start Code Function Syntax .....	11
Figure 5-2. Picture User Data Syntax with Luma NRZ Additional Data.....	13

## List of Tables

Table 5-1. Bitstream Data Elements and Conditions .....	9
Table 6-1. Coding of cc_type field .....	14
Table 6-2. Field Number for Picture User Data .....	15
Table 6-3. Pulse Shape .....	16
Table 6-4. NRZ Alpha .....	16

# 1. Introduction

## 1.1 Purpose

This document defines a standard for the carriage of Vertical Blanking Interval (VBI) services in MPEG-2 compliant bitstreams constructed in accordance with *ISO/IEC 13818-2*. The approach builds upon a data structure defined in the *ATSC A/53 Digital Television Standard*, and is designed to be backwards-compatible with that method.

## 1.2 Revisions

This version is the initial release.

## 1.3 Scope

The sections in this standard describing video user data extensions to MPEG-2 are organized as follows:

- **Section 1**—Provides an introduction
- **Section 2**—Lists applicable documents
- **Section 3**—Defines the acronyms and abbreviations used in this specification
- **Section 4**—Provides an overview of the VBI services supported
- **Section 5**—Specifies the video bitstream syntax for picture user data extensions
- **Section 6**—Describes the video bitstream semantics for picture user data extensions



## 2. Applicable Documents

The following documents may enhance the understanding of this specification:

1. *Generic Coding of Moving Pictures and Associated Audio, ISO/IEC 13818-2: 1995 (E)* International Standard (MPEG-2 Video).
2. *Generic Coding of Moving Pictures and Associated Audio, ISO/IEC 13818-1, International Standard, November, 1994 (MPEG-2 Systems).*
3. *Characteristics of Systems for Monochrome and Colour Television, CCIR Report 624-4, 1990.*
4. *Encoding Parameters of Digital Television for Studios, CCIR Recommendation 601-2, 1990.*
5. *ATSC A/53, Digital Television Standard (1995).*
6. Lewis, Boyd A. and Kempter P., *AMOL Signal Specifications*, Nielsen Engineering and Technology, January, 1994, Revision Level 1.1, Document Number ACN 403-1122-000.
7. Code of Federal Regulations, Title 47 (Telecommunication), Part 73, Section 699.
8. NTC Report No. 7, Video Facility Testing Technical Performance Objectives, 1976.
9. EIA-708, *Advanced Television Closed Captioning (ATVCC)*, Draft of October 29, 1996.
10. ANSI/EIA-608-1994, *Recommended Practice for Line 21 Data Service*, September 1994.
11. *AMOL Signal Specification*, Nielsen Engineering and Technology, Document Number ACN 403-1122-000, Revision Level 1.4, January 16, 1995.
12. *AMOL II Signal Specification*, Nielsen Engineering and Technology, Document Number ACN 403-1193-024, Revision Level 3.2, May 19, 1995.
13. EIA-516, *Joint EIA/CVCC Recommended Practice for Teletext: North American Basic Teletext Specification (NABTS)*, May 1988.
14. *World System Teletext and Data Broadcasting System*, Technical Specification, The Department of Trade and Industry, London, England, May 1987.
15. IEC-461, *Time and Control Code for Video Tape Recorders (VITC)*, Publication 461, International Electrotechnical Commission, 1986.





### 3. Acronyms and Abbreviations

ATSC	Advanced Television Systems Committee
AMOL	Automated Measurement of Lineups
bslbf	bit string left bit first
CCIR	International Radio Consultative Committee
EIA	Electronic Industries Association
FCC	Federal Communications Commission
IEC	International Electrotechnical Commission
ISO	International Standards Organization
LL	Low Level
lsb	least significant bit
ML	Main Level
MP	Main Profile
MPEG	Moving Picture Experts Group
msb	most significant bit
NTC	Network Transmission Committee
NTSC	National Television System Committee
PAL	Phase Alternate Line
SID	Source Identification
uimsbf	unsigned integer most significant bit first
VBI	Vertical Blanking Interval
VITC	Vertical Interval Time Code
VITS	Vertical Interval Test Signal



## 4. Video User Data Extensions

The video user data extensions to the MPEG-2 syntax and semantics described in this standard provide a means to support a number of VBI services beyond those supported in the original ATSC A/53 standard. Where the A/53 standard only supported EIA-608 closed caption data carried on line 21, the VBI enhancements extend support to include:

- a) EIA-608-compliant closed captioning for one or more VBI lines other than line 21 (Ref. [10])
- b) Nielsen Source Identification (SID)/Automated Measurement Of Lineups (AMOL) signals (Ref. [11] and [12])
- c) North American Basic Teletext per the EIA-516 NABTS Specification (Ref. [13])
- d) World System Teletext (WST) (Ref. [14])
- e) Vertical Interval Time Code (VITC) (Ref. [15])

### 4.1 Closed Captioning

Many television services carry closed caption information in line 21, field 1 of the VBI. According to the EIA-608 standard, closed caption data may also be carried in line 21 of field 2. Certain system service providers use the EIA-608 closed caption format to carry additional data in VBI lines other than line 21. The user data syntactic constructs described in this document allow multiple VBI lines per display field, including the standard line 21 closed caption usage.

### 4.2 Nielsen SID/AMOL Signals

AMOL encoding places information in line 20 of the VBI and includes a SID code and a date/time stamp. It is used by broadcasters to verify that programs or commercials air at the intended times. VBI user data syntactic constructs support one or more VBI lines for this purpose.

### 4.3 Other VBI Standards

The encoding method described in this standard is applicable to VBI standards in addition to those mentioned here because it is a general purpose method for representing a basic VBI waveform. The technique is applicable to PAL as well as NTSC. If the MPEG-2 video syntax carried a video program in PAL format, the syntax described here can be used as-is to carry VBI data and reconstruct a PAL standard video waveform.



## 5. Picture User Data Syntactic Extensions

The method used in this document for describing video bitstream syntax is the same as that used in the MPEG-2 International Standard, *ISO/IEC 13818-2*. The syntactic extensions to MPEG-2 Main Profile at Main Level operation for VBI services are implemented using the picture user data syntax defined in subsection 5.2.

### 5.1 Syntax Conventions and Definitions

#### 5.1.1 Method of Describing Bitstream Syntax

Those *ISO/IEC 13818-2* conventions and definitions that appear in VBI user data syntax are reviewed in the remainder of this subsection.

As exemplified in Table 5-1, this syntax resembles C code and uses the convention that a variable or expression evaluating to a non-zero value is equivalent to a condition that is true.

Table 5-1. Bitstream Data Elements and Conditions

<b>while ( condition ) {</b>	If the condition is true, then the group of data elements occurs next in the data stream. This repeats until the condition is not true.
<b>data_element</b>	
...	
<b>}</b>	The data element always occurs at least once.
<b>do {</b>	
<b>data_element</b>	
...	The data element is repeated until the condition is not true.
<b>} while ( condition )</b>	
<b>if ( condition ) {</b>	
<b>data_element</b>	If the condition is true, then the first group of data elements occurs next in the data stream.
...	
<b>} else {</b>	
<b>data_element</b>	If the condition is not true, then the second group of data elements occurs next in the data stream.
...	
<b>}</b>	
<b>for ( i = 0; i &lt; n; i++ ) {</b>	The group of data elements occurs n times. Conditional constructs within the group of data elements may depend on the value of the loop control variable i, which is set to zero for the first occurrence, incremented to one for the second occurrence, and so forth.
<b>data_element</b>	
...	
<b>}</b>	Explanatory comment that may be deleted entirely without in any way altering the syntax.
<b>/* comment ... */</b>	

## VBI EXTENSIONS FOR THE ATSC DIGITAL TELEVISION STANDARD

Each data item in the bitstream appears in bold type and is described by its name, its length in bits, and a mnemonic for its type and order of transmission. The action caused by a decoded data element in a bitstream depends on the value of that data element and on data elements previously decoded. The constructs in normal type in the above table are used to express the conditions when data elements are present.

A group of data elements may contain nested conditional constructs. For compactness, the {} are omitted when only one data element follows. Array data is represented as follows:

<b>data_element[n]</b>	the n+1th element of an array of data
<b>data_element[m][n]</b>	the m+1, n+1th element of a two-dimensional array of data

While the syntax descriptions given in this document are expressed in procedural terms, it should not be assumed that subsection 5.2 implements a satisfactory decoding procedure. In particular, it defines a correct and error-free input bitstream for compatible encoders. Actual decoders must include means to look for start codes in order to begin decoding correctly, and to identify errors, erasures and insertions while decoding. Neither the methods to identify these situations nor the actions to be taken are specified in this document.

### 5.1.2 Reserved, Forbidden & Marker Bits

The terms *reserved* and *forbidden* are used in the description of some values of several fields in the coded bitstream.

**reserved**—Indicates that the value may be used in the future for ISO/IEC-defined extensions.

**forbidden**—Indicates a value that shall never be used (usually in order to avoid emulation of start codes).

**marker\_bit**—Indicates a one-bit field in which the value zero is forbidden. These marker bits are introduced at several points in the syntax to avoid start code emulation.

#### Operators

+	Addition.
-	Subtraction (as a binary operator) or negation (as a unary operator).
++	Increment.
--	Decrement.
>	Greater than.
>=	Greater than or equal to.
<	Less than.
<=	Less than or equal to.
=	Equal to.
!=	Not equal to.
=	Assignment operator.

## PICTURE USER DATA SYNTACTIC EXTENSIONS

### 5.1.3 Mnemonics

The following mnemonics are defined to describe the different data types used in the user data syntax described in subsection 5.2:

**bslbf**—Bit string, left bit first, where “left” is the order in which bit strings are written in the specification. Bit strings are written as a string of 1s and 0s within single quote marks, e.g. ‘1000 0001’. Blanks within a bit string are for ease of reading and have no significance.

**uimbsf**—Unsigned integer, most significant bit first.

### 5.1.4 Start Codes

Start codes are specific bit patterns that do not otherwise occur in the video stream. Each start code consists of the 23-bit start code prefix string ‘0000 0000 0000 0000 0000 0001’ followed by an 8-bit integer that identifies the type of start code as described in ISO/IEC 13818-2. Start codes are always byte aligned, and may be preceded by any number of zero stuffing bits.

### 5.1.5 Definition of Functions

The following utility functions for picture coding algorithms are defined:

<b>bytealigned()</b>	returns 1 if the next bit in the bitstream is the first bit in a byte. Otherwise it returns 0.
<b>nextbits()</b>	permits comparison of a bit string with the next bits to be decoded in the bitstream.
<b>next_start_code()</b>	removes any zero bit and zero byte stuffing and locates the next start code as defined in Figure 5-1.

	No. of bits	Mnemonic
next_start_code() {		
while ( !bytealigned() )	1	0
zero_bit		
while ( nextbits() != '0000 0000 0000 0000 0000 0001' )	8	0000 0000
zero_byte		
}		

Figure 5-1. Next Start Code Function Syntax

## 5.2 Picture User Data Syntactic Extensions

The Picture user data syntax to support Luma NRZ VBI services is shown in Figure 5-2, where heavily outlined cells highlight syntactic extensions relative to the standard ATSC operation described in Ref. [5].



# VBI EXTENSIONS FOR THE ATSC DIGITAL TELEVISION STANDARD

	No. of bits	Mnemonic
user_data_FF		
user_data_start_code	32	bslbf
ATSC identifier	32	bslbf
user_data_type_code	8	uimsbf
if (user_data_type_code == '0x03') {		
process_em_data_flag	1	bslbf
process_cc_data_flag	1	bslbf
additional_data_flag	1	bslbf
cc_count	5	uimsbf
em_data	8	bslbf
for (i=0; i < cc_count; i++) {		
cc_line_offset	4	uimsbf
cc_field_parity	1	bslbf
cc_valid	1	bslbf
cc_type	2	bslbf
cc_data_1	8	bslbf
cc_data_2	8	bslbf
}	8	11111111
marker_bits		
if (additional_data_flag) {		
while (nextbits() != '0000 0000 0000 0000 0000 0001') {		
additional_data_type	8	uimsbf
additional_data_length	16	uimsbf
if (additional_data_type == '0x01') {		
luma_nrz_count	5	uimsbf
for (i=0; i < luma_nrz_count; i++) {		
luma_nrz_priority	2	uimsbf
field_number	2	uimsbf
line_offset	5	uimsbf
start_sample	9	uimsbf
nrz_increment	6	uimsbf
nrz_modulus	10	uimsbf
0_amplitude	8	uimsbf
1_amplitude	8	uimsbf
pulse_shape	2	uimsbf
if (pulse_shape == "rectangular") {		
symbol_to_transition_ratio	8	uimsbf
}		
if (pulse_shape == "raised_cosine") {		
reserved	3	bslbf
nrz_alpha	5	uimsbf
}		
if (pulse_shape == "reserved") {		
reserved	8	bslbf
}		

# PICTURE USER DATA SYNTACTIC EXTENSIONS

	No. of bits	Mnemonic
word_count	5	uimsbf
for (j=0 ; j<word_count ; j++) {		
marker_bit	1	bslbf
luma_nrz_word	22	bslbf
}		
marker_bit	1	bslbf
remainder_count	5	uimsbf
for (j=0 ; j<remainder_count ; j++) {		
luma_nrz_bit	1	bslbf
}		
marker_bit	1	bslbf
}		
}		
}		
next_start_code()		
}		

Figure 5-2. Picture User Data Syntax with Luma NRZ Additional Data.

## 6. Picture User Data Semantic Extensions

The semantic extensions for Luma NRZ VBI service enhancements are specified in this section.

**cc\_type**—A two-bit field that identifies the type of data carried in the `cc_data_1` and `cc_data_2` fields directly following. Table 6-1 defines the coding. Values '00' through '10' are as specified in EIA-708, *Advanced Television Closed Captioning (ATVCC)* (Ref. [9]). Value '11' is reserved in the EIA-708 standard, and is defined here to indicate that NTSC-style closed caption data per ANSI/EIA 608 are to be reconstructed on a line other than line 21. The `cc_line_offset` parameter identifies the line number in the NTSC waveform into which the data bytes shall be placed, and the `cc_field_parity` parameter indicates whether the data shall be placed into field 1 or field 2.

Table 6-1. Coding of `cc_type` field

cc_type	Meaning
00	NTSC line 21 field 1 closed captions
01	NTSC line 21 field 2 closed captions
10	ATV closed captions
11	NTSC closed captions not on line 21

**cc\_line\_offset**—Valid for `cc_type` value '11' only. A 4-bit unsigned integer in the range 1 to 11, excluding that represents the offset in lines from which EIA closed captioning data originated relative to the base VBI frame line: line 9 of 525-line (NTSC and PAL/M) field 1, or line 272 of 525-line field 2.

When `cc_type` is not equal to '11', `cc_line_offset` shall be set to all ones ('1111').

**cc\_field\_parity**—Valid for `cc_type` value '11' only. A flag that indicates the parity of the field within which closed caption data bytes are to be placed in the output waveform. A value of zero indicates first (odd) field. A value of one indicates second (even) field.

When `cc_type` is not equal to '11', `cc_field_parity` shall be set to value one ('1').

**additional\_data\_type**—An 8-bit integer (values in the range [1:255]) indicating the type of additional data constructs following the field. This field shall have the value 0x01 to indicate the additional data is Luma NRZ data.

**additional\_data\_length**—A 16-bit unsigned integer (values in the range [0:65535]) indicating the length in bytes of additional data constructs following the field. The length does not include the `additional_data_length` field itself, but includes the following `additional_data` for the given `additional_data_type`, up to but not including subsequent data of any other `additional_data_type`.

Another way to describe `additional_data_length` is to say that if a memory pointer points to the first byte of data following the `additional_data_length` field, bumping that pointer by the number of bytes

## PICTURE USER DATA SYNTACTIC EXTENSIONS

indicated by the `additional_data_length` results in the pointer pointing to the next `additional_data_type` byte, if further data is included.

**`luma_nrz_count`**—A five-bit integer (values in the range [0:31]) indicating the number of Luma NRZ constructs following the field. All such constructs must occur in the intended display order, assuming an interlaced display line and field display order.

**`luma_nrz_priority`**—A number between 0 and 3 indicating the priority of constructs in picture reconstruction where different levels of hardware capability exist.

**`field_number`**—The number of the field, in display order, from which the VBI data originated, interpreted in Table 6-2.

**Table 6-2.** Field Number for Picture User Data

Value	Meaning
00	Forbidden
01	1st display field
10	2nd display field
11	3rd display field (the repeated field in film mode).

**`line_offset`**—A five-bit integer (values in the range [1:31]) giving the offset in lines from which the Luma NRZ data originated relative to the base VBI frame line (line 9 of 525-line [NTSC and PAL/M] field 1, line 272 of 525-line field 2, line 5 of 625-line [all PAL except PAL/M] field 1, and line 318 of 625-line field 2), as specified in *CCIR Report 624-4*.

**`start_sample`**—A 9-bit unsigned integer (values in the range [0:511]) which indicates the sample of the reconstructed luminance line at which the transition into the first Luma NRZ symbol shall start. `start_sample` shall be in the same units as CCIR 601 (Ref. [4]) samples and shall be relative to the first sample of CCIR 601 reconstructed frames.

**`nrz_increment`**—A 6-bit unsigned integer (values in the range [1:63]) which indicates the Luma NRZ symbol clock increment value and takes on values that describe, together with `nrz_modulus`, the relationship of the Luma NRZ symbol clock to a 27 MHz reference. See the semantics of `nrz_modulus` for more details.

**`nrz_modulus`**—A 10-bit unsigned integer (values in the range [2:1023]) which indicates the Luma NRZ symbol clock modulus value and takes on values that describe, together with `nrz_increment`, the relationship of the Luma NRZ symbol clock to a 27 MHz reference. Specifically, `nrz_increment` and `nrz_modulus` are related to the Luma NRZ symbol rate as:

$$\text{nrz\_increment} / \text{nrz\_modulus} = \text{Luma NRZ symbol rate} / \text{system\_clock\_frequency}^1$$

where

`system_clock_frequency` is specified in ISO/IEC 13818-1 as 27 MHz  $\pm$  30 ppm.

**`0_amplitude`**—An 8-bit unsigned integer (values in the range [1:254]) which indicates the amplitude at which Luma NRZ symbols of value 0 shall be reconstructed in units of amplitude of CCIR 601 reconstructed frames.

<sup>1</sup>The value of `nrz_increment` must not exceed `nrz_modulus`-1.

# VBI EXTENSIONS FOR THE ATSC DIGITAL TELEVISION STANDARD

**1\_amplitude**—An 8-bit unsigned integer (values in the range [1:254]) which indicates the amplitude at which Luma NRZ symbols of value 1 shall be reconstructed in units of amplitude of CCIR 601 reconstructed frames.

**pulse\_shape**—A 2-bit unsigned integer which indicates the shape of the pulses which shall be used to reconstruct this line of Luma NRZ. The meaning of pulse\_shape is defined in Table 6-3.

**Table 6-3. Pulse Shape.**

pulse_shape	Luma NRZ Pulse Shape
00	rectangular
01	raised cosine
10	reserved
11	reserved

**symbol\_to\_transition\_ratio**—An 8-bit unsigned integer (values in the range [16:255]) which indicates the ratio of each Luma NRZ symbol's duration to each symbol's transition duration between the amplitudes specified by 0\_amplitude and 1\_amplitude and having units of  $2^{-4}$  (0.0625). This field describes symbols with a symbol to transition ratio ranging from 1.0 to 15.9375.

**nrz\_alpha**—A 5-bit unsigned integer (values in the range [0:31]) which indicates the value of Alpha for the Raised Cosine filter whose pulse shape describes each Luma NRZ symbol with units of  $2^{-5}$  (0.03125). This field describes values of Alpha from 0.03125 to 1.0. The meaning of nrz\_alpha is defined in Table 6-4.

**Table 6-4. NRZ Alpha.**

nrz_alpha	Alpha value
00000	1.0
00001-11111	nrz_alpha * 0.03125

**word\_count**—A 5-bit unsigned integer (values in the range [0:31]) which indicates the number of marker\_bit and luma\_nrz\_word pairs that follow this field.

**luma\_nrz\_word**—A 22-bit string of Luma NRZ symbols such that the first bit is the value of the first Luma NRZ symbol to be reconstructed on the video line as displayed from left to right. luma\_nrz\_words shall appear in the order that their symbols are to be reconstructed on the video line as displayed from left to right.

**remainder\_count**—A 5-bit unsigned integer (values in the range [0:21]) which indicates the number of luma\_nrz\_bits that follow this field.

**luma\_nrz\_bit**—A single bit representing the Luma NRZ symbol to be reconstructed on the video line. luma\_nrz\_bits shall appear in the order that their symbols are to be reconstructed on the video line, subsequent to symbols reconstructed from any luma\_nrz\_words, as displayed from left to right.

Sent on behalf of Mark Eyer.

cc: Rick  
(R-4.3)

-----  
The attached document is a revision of DVS-053, a draft specification of transport syntax for carriage of VBI data within an ATSC transport stream. This update resulted from preliminary review comments. Specifically, the syntax has been improved for cleaner backward-compatibility with the current ATSC syntax, and the waveform representation has been extended to support multi-level PAM for up to four bits per symbol.

Comments are appreciated on the approach, syntax, semantics, completeness, extensibility, compatibility with ATSC, etc.

Mark Eyer  
Principal Staff Engineer  
General Instrument  
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[[ DVS053R.DOC : 3910 in DVS053R.DOC ]]

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Exhibit 15 Page 490

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SCTE DVS/053  
January 20, 1997  
Rev. 1—March 4, 1997



*cc: Rick  
(R-4.3)*



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Document: SCTE DVS/053 Rev. 1      Date of Original Issue: January 20, 1997  
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## **VBI EXTENSIONS FOR THE ATSC DIGITAL TELEVISION STANDARD**





DVS-053  
Rev. 1—4 March 1997



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# VBI EXTENSIONS FOR THE ATSC DIGITAL TELEVISION STANDARD

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Revision: 1.1  
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Exhibit 15 Page 494

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Exhibit 15 Page 495

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# Contents

1. INTRODUCTION .....	1
1.1 Purpose.....	1
1.2 Scope.....	1
2. APPLICABLE DOCUMENTS.....	3
3. ACRONYMS AND ABBREVIATIONS.....	5
4. VIDEO USER DATA EXTENSIONS .....	7
4.1 Closed Captioning .....	7
4.2 Nielsen SID/AMOL Signals .....	7
4.3 Other VBI Standards .....	7
5. PICTURE USER DATA SYNTACTIC EXTENSIONS.....	9
5.1 Syntax Conventions and Definitions .....	9
5.1.1 Method of Describing Bitstream Syntax .....	9
5.1.2 Reserved, Forbidden & Marker Bits .....	10
5.1.3 Mnemonics .....	11
5.1.4 Start Codes .....	11
5.1.5 Definition of Functions .....	11
5.2 Picture User Data Syntactic Extensions.....	11
5.3 Additional EIA 608 Data.....	12
5.4 Luminance PAM Data Structure.....	13

## List of Figures

Figure 5-1. Next Start Code Function Syntax.....	11
Figure 5-2. Extensions to ATSC Picture User Data Syntax .....	12
Figure 5-3. Additional EIA 608 Data Structure and Syntax .....	13
Figure 5-4. Luminance PAM Data Structure and Syntax.....	14
Figure 5-1 Frequency Response of PRC Filter (Linear Scale) .....	17
Figure 5-2 PRC Impulse Response.....	17

## List of Tables

Table 5-1. Bitstream Data Elements and Conditions .....	9
Table 5-1. Field Number for Additional EIA 608 Data .....	13
Table 5-2. Field Number for Picture User Data .....	15
Table 5-3. Bits Per Symbol Encoding.....	16
Table 5-4. Pulse Shape.....	16
Table 5-5. PAM Alpha. ....	17

# 1. Introduction

## 1.1 Purpose

This document defines a standard for the carriage of Vertical Blanking Interval (VBI) services in MPEG-2 compliant bitstreams constructed in accordance with *ISO/IEC 13818-2*. The approach builds upon a data structure defined in the *ATSC A/53 Digital Television Standard*, and is designed to be backwards-compatible with that method.

## 1.2 Scope

The sections in this standard describing video user data extensions to MPEG-2 are organized as follows:

- **Section 1**—Provides an introduction
- **Section 2**—Lists applicable documents
- **Section 3**—Defines the acronyms and abbreviations used in this specification
- **Section 4**—Provides an overview of the VBI services supported
- **Section 5**—Specifies the video bitstream syntax and semantics for picture user data extensions





## 2. Applicable Documents

The following documents may enhance the understanding of this specification:

1. *Generic Coding of Moving Pictures and Associated Audio, ISO/IEC 13818-2: 1995 (E)* International Standard (MPEG-2 Video).
2. *Generic Coding of Moving Pictures and Associated Audio, ISO/IEC 13818-1, International Standard, November, 1994 (MPEG-2 Systems).*
3. *Characteristics of Systems for Monochrome and Colour Television, CCIR Report 624-4, 1990.*
4. *Encoding Parameters of Digital Television for Studios, CCIR Recommendation 601-2, 1990.*
5. *ATSC A/53, Digital Television Standard (1995).*
6. Lewis, Boyd A. and Kempter P., *AMOL Signal Specifications*, Nielsen Engineering and Technology, January, 1994, Revision Level 1.1, Document Number ACN 403-1122-000.
7. Code of Federal Regulations, Title 47 (Telecommunication), Part 73, Section 699.
8. NTC Report No. 7, *Video Facility Testing Technical Performance Objectives*, 1976.
9. EIA-708, *Advanced Television Closed Captioning (ATVCC)*, Draft of October 29, 1996.
10. ANSI/EIA-608-1994, *Recommended Practice for Line 21 Data Service*, September 1994.
11. *AMOL Signal Specification*, Nielsen Engineering and Technology, Document Number ACN 403-1122-000, Revision Level 1.4, January 16, 1995.
12. *AMOL II Signal Specification*, Nielsen Engineering and Technology, Document Number ACN 403-1193-024, Revision Level 3.2, May 19, 1995.
13. EIA-516, *Joint EIA/CVCC Recommended Practice for Teletext: North American Basic Teletext Specification (NABTS)*, May 1988.
14. *World System Teletext and Data Broadcasting System*, Technical Specification, The Department of Trade and Industry, London, England, May 1987.
15. IEC-461, *Time and Control Code for Video Tape Recorders (VITC)*, Publication 461, International Electrotechnical Commission, 1986.



### 3. Acronyms and Abbreviations

ATSC	Advanced Television Systems Committee
AMOL	Automated Measurement of Lineups
bslbf	bit string left bit first
CCIR	International Radio Consultative Committee
EIA	Electronic Industries Association
FCC	Federal Communications Commission
IEC	International Electrotechnical Commission
ISO	International Standards Organization
LL	Low Level
lsb	least significant bit
ML	Main Level
MP	Main Profile
MPEG	Moving Picture Experts Group
msb	most significant bit
NTC	Network Transmission Committee
NTSC	National Television System Committee
PAL	Phase Alternate Line
PAM	Pulse Amplitude Modulation
SID	Source Identification
uimsbf	unsigned integer most significant bit first
VBI	Vertical Blanking Interval
VITC	Vertical Interval Time Code
VITS	Vertical Interval Test Signal